Department of Pesticide Regulation

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# MEMORANDUM

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SUBJECT: EVALUATION OF AMBIENT AIR MONITORING AND TOWNSHIP-MONTH USE POUND DISTRIBUTION OF METHYL BROMIDE FOR SUBCHRONIC EXPOSURE ASSESSMENT

In this analysis, township-monthly use levels of methyl bromide in California were calculated for year 2001, and maximum monthly average air concentrations for each township were estimated with the maximum monthly methyl bromide use of that township. The estimation was based on an empirical relationship between ambient air concentration and use in a $6x6^2$ mile area. Also evaluated was the representativeness of the methyl bromide air monitoring by the Air Resources Board (ARB) and the Alliance of the Methyl Bromide Industry (AMBI) in 2001. Based on the Pesticide Use Report (PUR) database of 2001, a frequency distribution curve of township-monthly use was derived, and townships with the highest subchronic exposure levels were identified.

## Introduction

Subchronic air exposure of methyl bromide has been a concern in heavy use agricultural areas. At the request of the Department of Pesticide Regulation (DPR), ARB conducted ambient air monitoring in Monterey, Santa Cruz, and Kern counties in 2000 and 2001 [1,2,3,4]. The Alliance of the Methyl Bromide Industry (AMBI) conducted similar monitoring in Ventura and Santa Barbara counties in 2001 [5], and in Ventura, Santa Cruz and Monterey counties in 2002 [6]. DPR staff analyzed the air monitoring data and established some empirical relationships between the ambient air concentration and the use in certain areas and periods [7,8]. The township use limit, corresponding to a reference concentration, was back-calculated based on a regression model between air concentration and use in a 6x6 area, which was interpolated from uses in 5x5 and 7x7 areas [9]. The air monitoring was intended to cover heavy use areas and periods in California. At the time of monitoring, however, it was uncertain to what extent the surrounding use around monitoring sites would represent a heavy use scenario. Now that the year 2001 PURs have been collected and are available in the PUR database, we can evaluate the use intensity (defined as applied methyl bromide mass in a unit area and in a unit time,

the use intensity (defined as applied methyl bromide mass in a unit area and in a unit time, or lbs/township-month) near the monitoring sites in relation to those in other areas and time periods in California. Moreover, the point measurements at these monitoring sites and the empirical models derived from these measurements could be used to evaluate exposure risks at other times and places in the State. Therefore, the purpose of this analysis is (1) to evaluate the degree of use surrounding the monitoring sites, (2) to estimate the township-month use level and its frequency distribution, and (3) to identify the townships with the highest subchronic air concentration levels in 2001.

## Material and Methods

Regression Model

The regression model between air concentration and use over 6x6 mile$^2$ area over an 8-week period is described in equation (1). The model was derived using 2000 and 2001 ARB monitoring data and AMBI 2002 monitoring data [9].

$$Y = 0.732 + 0.0000721X \quad (1)$$

where Y represents the mean of weekly average air concentrations over a period of eight weeks, and X is the mean of weekly use pounds over the 6x6 mile$^2$ area in the same period (lbs/6x6sections-week). A conversion coefficient of 4.286 is applied to equation (1) to estimate the monthly average air concentration for the center of a township from the township-monthly use pounds. One month is counted as 30 days in this conversion.

Reference Concentration and Township Use Level for Subchronic Exposure

DPR proposed nine parts per billion (ppb) as a regulatory reference concentration for subchronic exposure of methyl bromide. The proposed township use limit corresponding to the nine ppb regulatory goal is 266,194 lbs/township-month [9].

Township-Monthly Use Distribution

Methyl bromide use records of 2001 were queried from the PUR database and summarized by township and month. The resultant list consists of total use pounds for each unique combination of township and month. The list was sorted based on use pounds by ascending order and the cumulative frequency of distribution was calculated and plotted.

Evaluation of Relative Use Around Ambient Air Monitoring Sites

The monthly use of townships with monitoring sites was compared to township-monthly use distribution to gauge the representativeness of location and time of monitoring. This comparison offered an assessment of whether the monitoring was indeed conducted in heavy use townships and months.

Subchronic Air Exposure Level Assessment
From the township-monthly use frequency distribution curve and the use-concentration relationship, air concentration levels for subchronic exposure can be evaluated with respect to the cumulative frequency distribution of methyl bromide use. For any given concentration, a percentage of township-monthly use that might result in a higher concentration level can be determined.

**Results**

Township-Monthly Use Frequency Distribution
For each township with positive use in year 2001, the use in each month was calculated. The cumulative frequency distribution of township-monthly use in 2001 for the whole state is shown in Figure 1. Although the use pound covers a big range, from 0 to 202,385 lbs/township-month, 90% is less than 17,174 lbs/township-month, and 95% is less than 34,265 lbs/township-month. Of the 860 township-months with methyl bromide use in 2001, no township-monthly use exceeded the proposed use cap (266,194 lbs/township-month).

The maximum monthly use for each township in 2001 was listed in Table 1a, with the estimated air concentration using equation (1). The maximum township-monthly use was 202,385 lbs and the estimated air concentration at this level of use was 4.14 ppb. There were 52 townships with estimated air concentration equal or greater than one ppb for at least one month. This number was 83 in 2000 (Table 1b). The spatial distribution of maximum monthly township use for the state was also shown in Figure 2, and Figure 3-4 shown the maximum monthly township uses for Monterey/Santa Cruz counties and Santa Barbara/Ventura counties. There are only a few townships where the maximum monthly use exceeds 90,000 lbs/township-month or 2.24 ppb of air concentration.

Top Annual Use Townships
Townships are sorted based on their annual total use pounds in 2001, and townships with one or more months of use exceeding the one ppb township-monthly use level are listed in Table 1. The townships monitored by the ARB and the AMBI are marked in the second column with the monitoring sites. All top eight townships of use in 2001 were monitored by either ARB or AMBI and the monitoring took place in months with the heaviest use. The top 15 annual use townships for the year 2000 were also presented in Table 4. The top five use townships remained unchanged from 2000 to 2001, but the use amount decreased.

Percentiles of Monitored Township-Monthly Uses
The ARB air monitoring in Monterey and Santa Cruz was primarily in September and October, and during July and August in Kern County. The AMBI air monitoring in Ventura and Santa

Barbara was primarily in August and September. The monitored township-monthly use was compared to the township-monthly use distribution curve derived from the whole State, and the percentile of top township-monthly use pounds of monitoring are listed in Table 3. Some monitoring sites are not shown in Table 3 because of their relative low percentile of township-monthly use. All top four cases of township-monthly use were monitored. The percentiles of township-monthly use pounds were above 95% for most monitoring sites. In other words, 95% of township-month use pounds in California in 2001, were lower than those of monitored townships and months. Therefore, the monitored sites and months were well chosen. Most of these heavy use cases were in areas of Monterey/Santa Cruz and Ventura/Santa Barbara.

**Conclusions**

The ambient air monitoring by the ARB and the AMBI was conducted in high-use areas during high-use periods. The monitoring locations and periods covered the townships and months with the top use intensity. The air monitoring captured the heaviest use scenarios in California in 2001.

bcc: Segawa Surname File

**References**

[1] ARB, 2001. Ambient air monitoring for methyl bromide and 1,3-Dichloropropene in Monterey/Santa Cruz Counties - Fall 2000. California Air Resources Board. Sacramento, CA.

[2] ARB, 2001. Ambient air monitoring for methyl bromide and 1,3-Dichloropropene in Kern County - Summer 2000. California Air Resources Board. Sacramento, CA.

[3] ARB, 2002. Ambient air monitoring for methyl bromide and 1,3-Dichloropropene in Monterey/Santa Cruz Counties - Fall 2001. California Air Resources Board. Sacramento, CA.

[4] ARB, 2002. Ambient air monitoring for methyl bromide and 1,3-Dichloropropene in Kern County - Summer 2001. California Air Resources Board. Sacramento, CA.

[5] Alliance of the Methyl Bromide Industry, 2002. Methyl bromide ambient air monitoring in Oxnard/Camarillo and Santa Maria, August-October, 2001. Alliance of the Methyl Bromide Industry, Sacramento, CA.

[6] Alliance of the Methyl Bromide Industry, 2003. Methyl bromide air monitoring: Ventura, Santa Cruz, and Monterey Counties, July-October, 2002. Alliance of the Methyl Bromide Industry, Sacramento, CA.

[7] LinYing Li, Bruce Johnson and Randy Segawa, 2001. Empirical relationships between use, area, and ambient air concentration of methyl bromide for subchronic exposure concerns. California Department of Pesticide Regulation, Sacramento, CA.

[8] LinYing Li, Bruce Johnson and Randy Segawa, 2002. Analysis of methyl bromide ambient air concentration data monitored by the Air Resources Board and the Alliance of Methyl Bromide Industry in year 2001(draft). California Department of Pesticide Regulation, Sacramento, CA.

[9] Memorandum: Bruce Johnson and Lin Ying Li to Randy Segawa: Calculation of a tolerance interval for a township limit on methyl bromide use to control subchronic exposure. California Department of Pesticide Regulation, Sacramento, CA

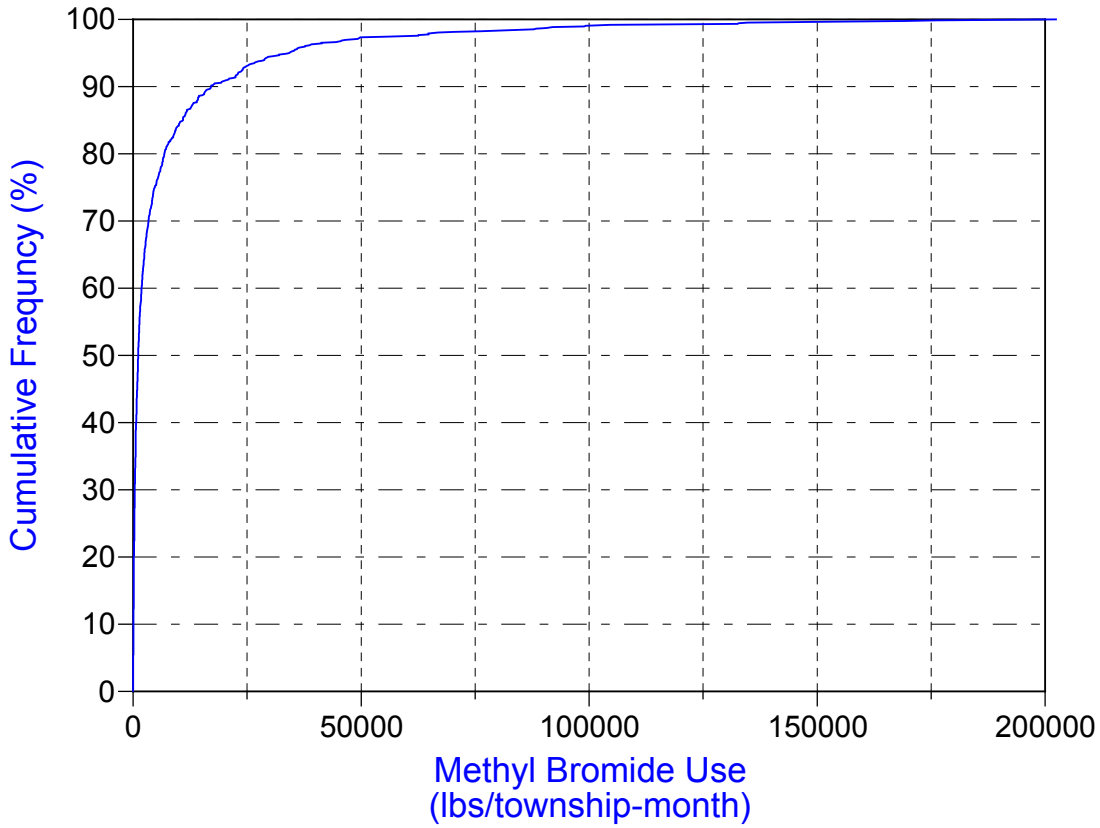


**Figure 1. Frequency Distribution of township-monthly use of methyl bromide in the State of California in 2001**

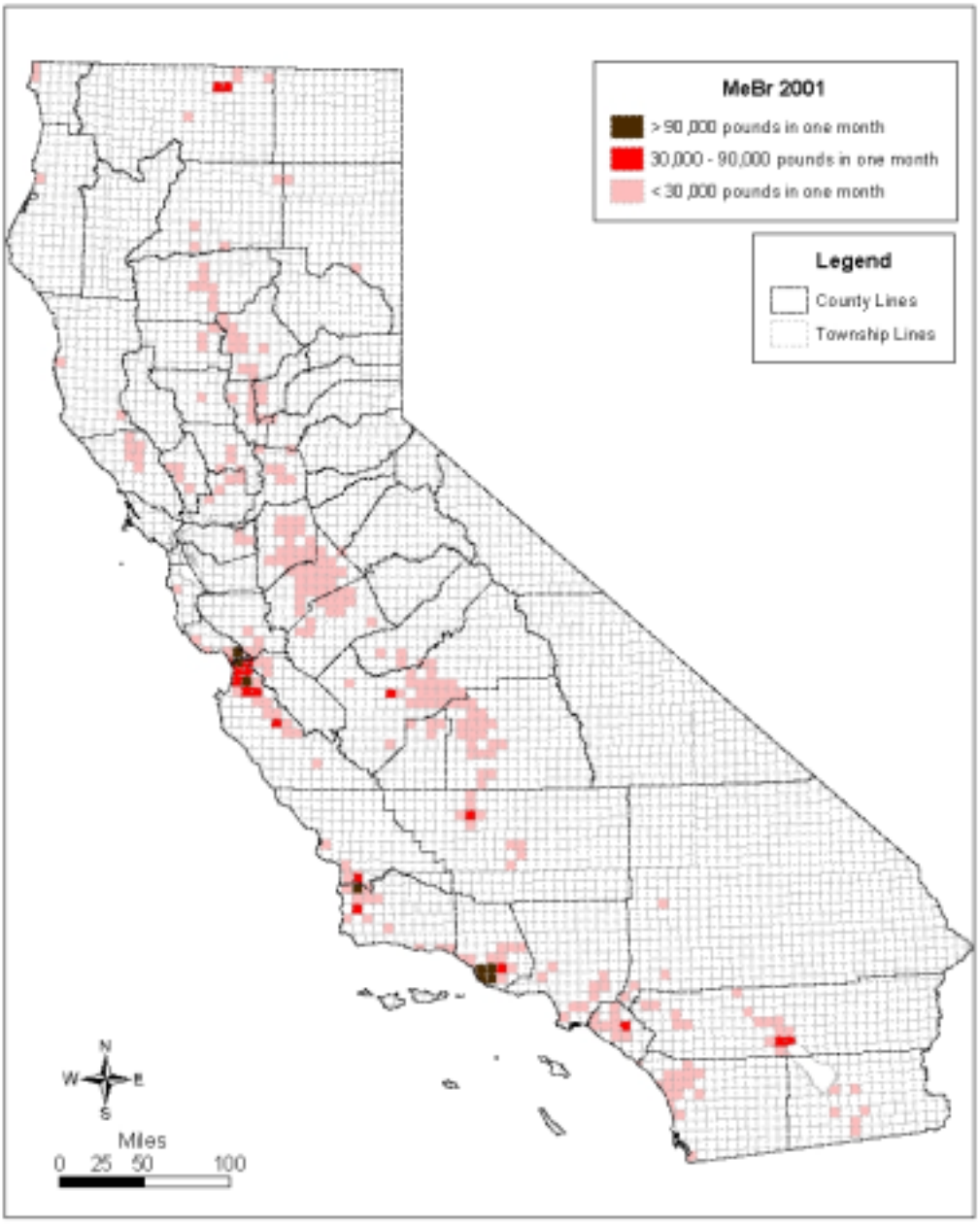


**Figure 2. Township use map of methyl bromide in three consecutive months in California in 2001**

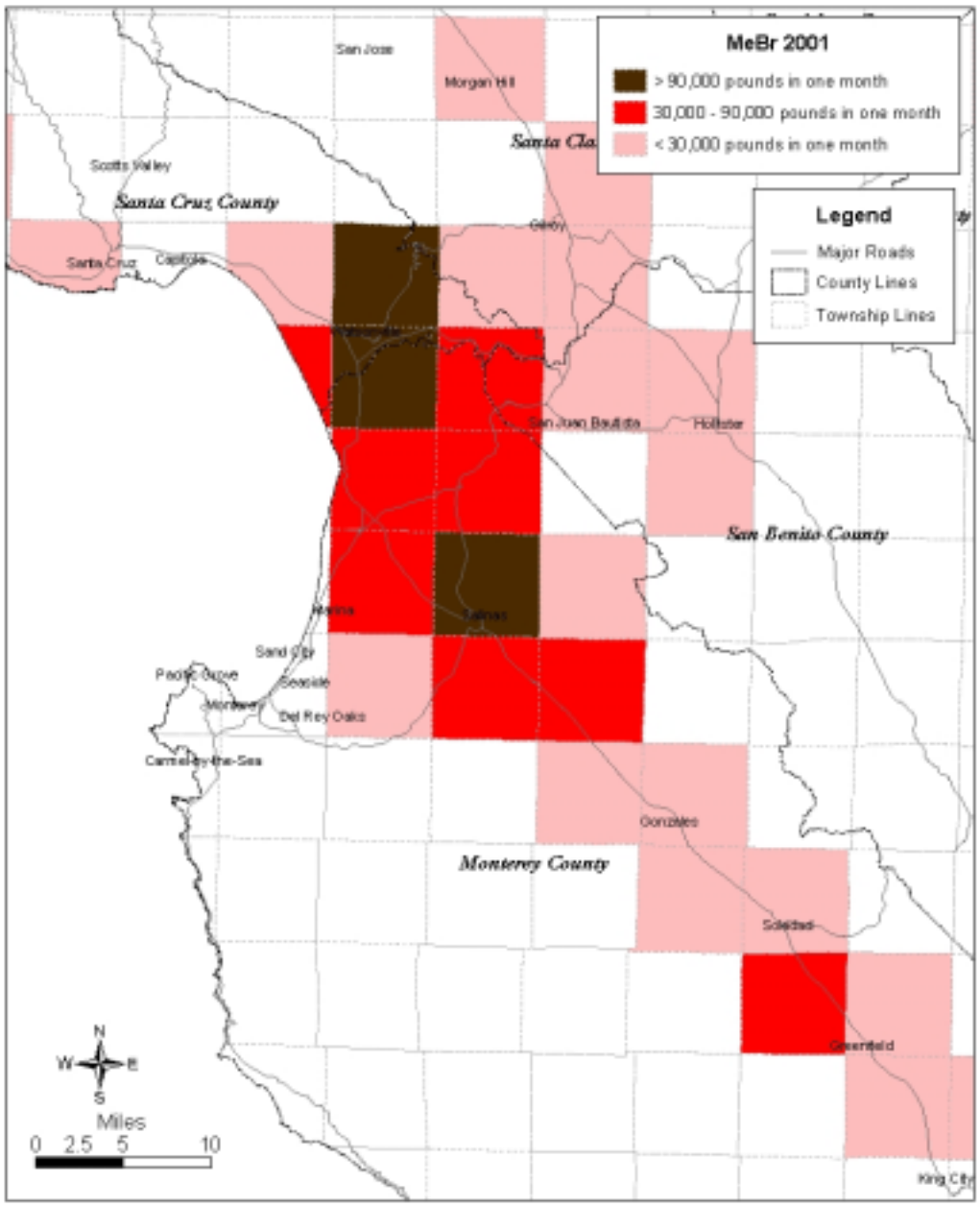


**Figure 3. Township use map of methyl bromide in three consecutive months in Monterey/Santa Cruz counties in 2001**

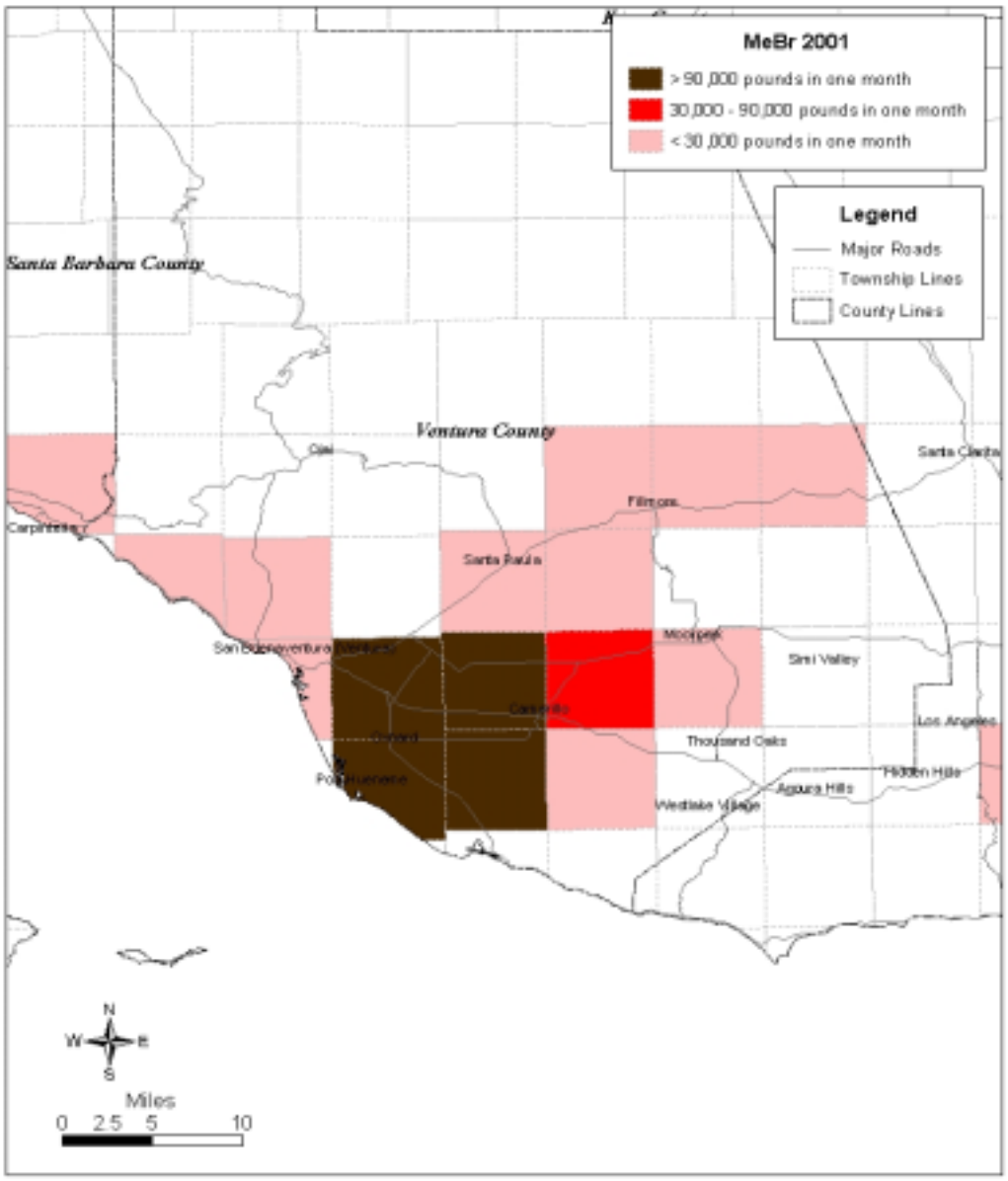


**Figure 4. Township use map of methyl bromide in three consecutive months in Santa Barbara and Ventura counties in 2001**

Table 1a. Townships with estimated air concentration ≥ 1 ppb for at least one month in 2001

| Rank | Township | County | Max Month Use (lbs/mo) | Concentration (ppb) |
|---|---|---|---|---|
| 1 | M12S02E | MONTEREY/SANTA CRUZ | 202,385 | 4.14 |
| 2 | S01N21W | VENTURA | 176,181 | 3.70 |
| 3 | S02N21W | VENTURA | 169,171 | 3.58 |
| 4 | S02N22W | VENTURA | 154,797 | 3.34 |
| 5 | S10N34W | SANTA BARBARA | 132,579 | 2.96 |
| 6 | M14S03E | MONTEREY | 104,603 | 2.49 |
| 7 | M11S02E | SANTA CRUZ | 91,984 | 2.28 |
| 8 | S01N22W | VENTURA | 90,635 | 2.26 |
| 9 | M15S17E | SANTA CRUZ | 88,350 | 2.22 |
| 10 | M46N01W | SISKIYOU | 87,881 | 2.21 |
| 11 | M15S04E | MONTEREY | 70,446 | 1.92 |
| 12 | M14S02E | MONTEREY | 64,815 | 1.82 |
| 13 | M13S02E | MONTEREY | 62,607 | 1.79 |
| 14 | M12S01E | MONTEREY/SANTA CRUZ | 62,554 | 1.78 |
| 15 | S05S08W | ORANGE | 46,617 | 1.52 |
| 16 | M13S03E | MONTEREY | 45,740 | 1.50 |
| 17 | M12S03E | MONTEREY/SANTA CRUZ | 45,565 | 1.50 |
| 18 | S07S09E | RIVERSIDE | 37,783 | 1.37 |
| 19 | S11N34W | SAN LUIS OBISPO | 36,475 | 1.35 |
| 20 | M27S25E | KERN | 36,136 | 1.34 |
| 21 | S08N34W | SANTA BARBARA | 35,946 | 1.34 |
| 22 | M18S06E | MONTEREY | 34,802 | 1.32 |
| 23 | M15S03E | MONTEREY | 34,265 | 1.31 |
| 24 | S02N20W | VENTURA | 33,693 | 1.30 |
| 25 | S07S08E | RIVERSIDE | 32,069 | 1.27 |
| 26 | M46N02W | SISKIYOU | 30,714 | 1.25 |
| 27 | M37N05E | SHASTA | 29,613 | 1.23 |
| 28 | M04S11E | STANISLAUS | 29,313 | 1.23 |
| 29 | M15S18E | FRESNO | 28,962 | 1.22 |
| 30 | M02S09E | SAN JOAQ / STANISLAUS | 28,763 | 1.22 |
| 31 | S10S04W | SAN DIEGO | 26,545 | 1.18 |
| 32 | M43N05W | SISKIYOU | 25,467 | 1.16 |
| 33 | M32S29E | KERN | 25,245 | 1.16 |
| 34 | M19S25E | TULARE | 24,858 | 1.15 |
| 35 | M08S15E | MERCED | 24,709 | 1.15 |
| 36 | S10N33W | SANTA BARBARA | 24,161 | 1.14 |
| 37 | S09N33W | SANTA BARBARA | 23,845 | 1.13 |
| 38 | S01N20W | VENTURA | 23,667 | 1.13 |
| 39 | M26N03W | TEHAMA | 23,076 | 1.12 |
| 40 | M25S25E | KERN | 22,995 | 1.12 |
| 41 | M14S19E | FRESNO | 22,537 | 1.11 |
| 42 | S02N23W | VENTURA | 22,479 | 1.11 |

| Rank | Township | County | Max Month Use (lbs/mo) | Concentration (ppb) |
|---|---|---|---|---|
| 43 | S06S08W | ORANGE | 21,059 | 1.09 |
| 44 | M14S23E | FRESNO | 20,893 | 1.08 |
| 45 | S11S05W | SAN DIEGO | 20,461 | 1.08 |
| 46 | M14S04E | MONTEREY | 19,417 | 1.06 |
| 47 | M21N03W | GLENN | 17,558 | 1.03 |
| 48 | M03S12E | STANISLAUS | 17,176 | 1.02 |
| 49 | S08S08E | RIVERSIDE | 17,041 | 1.02 |
| 50 | S03N21W | VENTURA | 16,151 | 1.00 |
| 51 | M11S04E | SAN BENITO | 16,029 | 1.00 |
| 52 | H18N01W | DEL NORTE | 15,646 | 1.00 |

Table 1b. Townships with estimated air concentration ≥ 1 ppb for at least one month in 2000

| Rank | Township | County | Max Month Use (lbs/mo) | Concentration (ppb) |
|---|---|---|---|---|
| 1 | S02N22W | VENTURA | 204,198 | 4.17 |
| 2 | M12S02E | MONTEREY / SANTA CRUZ | 201,165 | 4.12 |
| 3 | S01N21W | VENTURA | 176,720 | 3.71 |
| 4 | S10N34W | SAN LUIS OBISPO / SANTA BARBARA | 167,183 | 3.54 |
| 5 | M07S11E | MERCED | 109,625 | 2.58 |
| 6 | S02N20W | VENTURA | 93,091 | 2.30 |
| 7 | S02N21W | VENTURA | 90,127 | 2.25 |
| 8 | M14S03E | MONTEREY | 88,833 | 2.23 |
| 9 | M27S25E | KERN | 86,883 | 2.19 |
| 10 | M15S18E | FRESNO | 85,849 | 2.18 |
| 11 | S10N33W | SAN LUIS OBISPO / SANTA BARBARA | 83,351 | 2.13 |
| 12 | M13S02E | MONTEREY | 82,321 | 2.12 |
| 13 | S01N22W | VENTURA | 73,580 | 1.97 |
| 14 | M14S02E | MONTEREY | 70,393 | 1.92 |
| 15 | M25S26E | TULARE | 68,150 | 1.88 |
| 16 | M23S26E | TULARE / KERN | 61,856 | 1.77 |
| 17 | M37N05E | LASSEN / SHASTA | 61,406 | 1.77 |
| 18 | S07S09E | RIVERSIDE | 60,760 | 1.75 |
| 19 | S11N34W | SAN LUIS OBISPO / SANTA BARBARA | 58,040 | 1.71 |
| 20 | M12S03E | MONTEREY / SAN BENITO / SANTA CLARA / SANTA CRUZ | 57,443 | 1.70 |
| 21 | H18N01W | DEL NORTE | 56,183 | 1.68 |
| 22 | M11S02E | SANTA CLARA / SANTA CRUZ | 54,187 | 1.64 |
| 23 | M46N01W | SISKIYOU | 52,741 | 1.62 |
| 24 | S08S08E | RIVERSIDE / SAN DIEGO | 46,526 | 1.51 |
| 25 | S05S08W | ORANGE | 45,874 | 1.50 |
| 26 | M14S04E | MONTEREY/SAN BENITO | 44,968 | 1.49 |
| 27 | M28S21E | KERN | 44,901 | 1.49 |
| 28 | M13S03E | MONTEREY / SAN BENITO | 44,796 | 1.49 |

| Rank | Township | County | Max Month Use (lbs/mo) | Concentration (ppb) |
|---|---|---|---|---|
| 29 | S05S07E | RIVERSIDE | 43,794 | 1.47 |
| 30 | S07S08E | RIVERSIDE | 43,457 | 1.46 |
| 31 | M14S19E | FRESNO | 42,723 | 1.45 |
| 32 | S11S05W | SAN DIEGO | 41,456 | 1.43 |
| 33 | M26S24E | KERN | 39,957 | 1.40 |
| 34 | M02S07E | SAN JOAQUIN / STANISLAUS | 38,198 | 1.37 |
| 35 | S06S08W | ORANGE | 38,024 | 1.37 |
| 36 | S14S13E | IMPERIAL | 37,810 | 1.37 |
| 37 | M27S24E | KERN | 37,103 | 1.36 |
| 38 | S02N23W | VENTURA | 36,849 | 1.35 |
| 39 | S09N34W | SANTA BARBARA | 36,616 | 1.35 |
| 40 | M15S17E | FRESNO | 36,333 | 1.34 |
| 41 | M14S23E | FRESNO | 36,118 | 1.34 |
| 42 | M09S16E | MADERA / MERCED | 34,291 | 1.31 |
| 43 | M27S26E | KERN | 32,131 | 1.27 |
| 44 | M15S04E | MONTEREY | 31,403 | 1.26 |
| 45 | M08S15E | MERCED | 31,400 | 1.26 |
| 46 | M31S29E | KERN | 30,930 | 1.25 |
| 47 | M19S25E | TULARE | 30,720 | 1.25 |
| 48 | S10S04W | SAN DIEGO | 29,994 | 1.24 |
| 49 | M02S11E | STANISLAUS | 29,510 | 1.23 |
| 50 | S06S08E | RIVERSIDE | 29,361 | 1.23 |
| 51 | M04S10E | STANISLAUS | 28,734 | 1.22 |
| 52 | M12S01E | MONTEREY / SANTA CRUZ | 28,163 | 1.21 |
| 53 | M14S17E | FRESNO | 28,098 | 1.20 |
| 54 | M04S11E | STANISLAUS | 27,562 | 1.20 |
| 55 | M05S11E | MERCED / STANISLAUS | 27,296 | 1.19 |
| 56 | S01N20W | VENTURA | 27,146 | 1.19 |
| 57 | S03N21W | VENTURA | 27,109 | 1.19 |
| 58 | S11N18W | KERN | 26,680 | 1.18 |
| 59 | M06S12E | MERCED | 26,532 | 1.18 |
| 60 | M15S23E | FRESNO | 25,897 | 1.17 |
| 61 | S02S07W | RIVERSIDE / SAN BERNARDINO | 25,554 | 1.16 |
| 62 | M28N03W | TEHAMA | 24,819 | 1.15 |
| 63 | M11S03E | SANTA CLARA / SANTA CRUZ | 24,165 | 1.14 |
| 64 | S06S07E | RIVERSIDE | 23,324 | 1.12 |
| 65 | M06S11E | MERCED | 22,218 | 1.11 |
| 66 | M13N11W | LAKE / MENDOCINO | 22,137 | 1.10 |
| 67 | M15S03E | MONTEREY | 22,118 | 1.10 |
| 68 | M05S10E | MERCED / STANISLAUS | 21,753 | 1.10 |
| 69 | M14N03E | SUTTER / YUBA | 21,468 | 1.09 |
| 70 | M22S10E | MONTEREY | 18,816 | 1.05 |
| 71 | M43N05W | SISKIYOU | 18,494 | 1.04 |
| 72 | M11S01E | SANTA CRUZ | 18,450 | 1.04 |

| Rank | Township | County | Max Month Use (lbs/mo) | Concentration (ppb) |
|---|---|---|---|---|
| 73 | M32S29E | KERN | 18,291 | 1.04 |
| 74 | S05S10W | ORANGE | 18,109 | 1.04 |
| 75 | S12S04W | SAN DIEGO | 17,640 | 1.03 |
| 76 | S08S09E | SAN DIEGO | 17,630 | 1.03 |
| 77 | M07N05W | NAPA | 17,083 | 1.02 |
| 78 | S09N33W | SANTA BARBARA | 16,976 | 1.02 |
| 79 | M01S06E | SAN JOAQUIN | 16,903 | 1.02 |
| 80 | M03N05E | SAN JOAQUIN | 16,772 | 1.01 |
| 81 | S01N23W | VENTURA | 16,243 | 1.01 |
| 82 | M03S12E | STANISLAUS | 16,135 | 1.00 |
| 83 | M46N02W | SISKIYOU | 15,700 | 1.00 |

Table 2. Top 10 townships of annual methyl bromide use (lbs/township) in 2001 and use distribution in each month

| County | Site | Township | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monterey/Santa Cruz | PMS[a] | M12S02E | 0 | 0 | 1842 | 811 | 2049 | 12927 | 10957 | **132797** | **202385** | **82054** | 3411 | 0 | 449233 |
| Ventura | ABD[b] | S02N22W | 675 | 0 | 1216 | 761 | 11528 | **99007** | **134842** | **154797** | **34564** | 3315 | 984 | 1037 | 442726 |
| Ventura | PVW[b] | S01N21W | 140 | 0 | 921 | **24221** | 2978 | **27455** | **76384** | **176181** | 12623 | 534 | 6631 | 553 | 328621 |
| Monterey | SAL[a],LJE[a] | M14S03E | 0 | 0 | 0 | 0 | 8395 | **49590** | **39132** | **104603** | **66897** | **38722** | 2753 | 0 | 310092 |
| Santa Barbara | EDW[b] | S10N34W | 0 | 0 | 0 | 0 | 3283 | 1250 | 0 | **17174** | **132579** | **99241** | 1873 | 0 | 255400 |
| Ventura | UWC[b] | S02N21W | 0 | 0 | 0 | 2351 | 6449 | 2258 | **55625** | **169171** | 15205 | 402 | 0 | 225 | 251686 |
| Santa Cruz | SES[a],MES[a] | M11S02E | 0 | 0 | 0 | 2135 | 4342 | 7662 | **17005** | **49269** | **91984** | **41379** | 2503 | 0 | 216279 |
| Ventura | SHA[b] | S01N22W | 225 | 74 | 2344 | 3544 | 7214 | **64818** | **25936** | **90635** | **17771** | 1345 | 1111 | 331 | 215348 |
| Santa Cruz | | M12S01E | 0 | 0 | 0 | 259 | 12795 | 5985 | 13970 | **24036** | **62554** | **41366** | 0 | 0 | 160965 |
| Monterey | | M13S02E | 0 | 0 | 0 | 4494 | 3571 | 0 | 0 | **21978** | **62607** | **49809** | 0 | 0 | 142459 |

[a] ARB monitoring sites, [b] AMBI monitoring sites
* Numbers in bold fond indicate the township-month use might result in an air concentration higher than 1 ppb

Table 3. The percentile of township-monthly use cases monitored by ARB and AMBI in top eight use townships in 2001

| County | Site | Township | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monterey/Santa Cruz | PMS[a] | M12S02E | | | | | | | | | 100.00 | 98.37 | | | |
| Ventura | ABD[b] | S02N22W | | | | | | | | 99.65 | 95.12 | | | | |
| Ventura | PVW[b] | S01N21W | | | | | | | | 99.88 | 86.74 | | | | |
| Monterey | SAL[a],LJE[a] | M14S03E | | | | | | | | | 98.02 | 96.16 | | | |
| Santa Barbara | EDW[b] | S10N34W | | | | | | | | 90.00 | 99.30 | | | | |
| Ventura | UWC[b] | S02N21W | | | | | | | | 99.77 | 88.72 | | | | |
| Santa Cruz | SES[a],MES[a] | M11S02E | | | | | | | | | 98.84 | 96.51 | | | |
| Ventura | SHA[b] | S01N22W | | | | | | | | 98.72 | 90.35 | | | | |

[a] ARB monitoring sites, and monitoring was primarily in September and October
[b] AMBI monitoring sites, and monitoring was primarily in August and September

Table 4. Top 15 townships of annual methyl bromide use (lbs/township) in 2000 and use distribution in each month

| County | Site | Township | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventura | ABD[b] | S02N22W | 11708 | 450 | 8594 | 9485 | **27986** | **100431** | **201165** | **149593** | **82298** | 4604 | 4565 | 4570 | 605449 |
| Monterey/Santa Cruz | PMS[a] | M12S02E | 0 | 0 | 1233 | 2035 | 9159 | **21324** | 5546 | **85307** | **204198** | **130315** | 8525 | 804 | 468446 |
| Ventura | PVW[b] | S01N21W | 681 | 0 | 8058 | **17955** | **25089** | **27212** | **66077** | **176720** | **41847** | 3825 | 7136 | 1013 | 375613 |
| Ventura | EDW[b] | S10N34W | 4031 | 0 | 0 | 0 | 8817 | 4688 | 0 | 643 | **129447** | **167183** | 6415 | 11000 | 332224 |
| Monterey | SAL[a],LJE[a] | M14S03E | 0 | 0 | 0 | 0 | **23664** | **48373** | **40439** | **43784** | **90127** | **34506** | 774 | 0 | 281667 |
| Merced | | M07S11E | **50607** | **85849** | **40554** | **51774** | 8678 | 0 | 0 | 0 | 0 | 0 | 0 | **24154** | 261616 |
| Monterey | | M13S02E | 0 | 0 | 0 | 0 | 1867 | **14466** | 5159 | **51416** | **79043** | **88833** | **19081** | 0 | 259865 |
| Santa Cruz | SES[a],MES[a] | M11S02E | 274 | 0 | 2486 | 12010 | 2620 | 0 | 9363 | **38763** | **82321** | **76281** | 5626 | 0 | 229744 |
| Monterey | | M14S02E | 0 | 0 | **48106** | 1632 | 6567 | 1981 | 1008 | 8556 | **50604** | **83351** | **15532** | 0 | 217337 |
| Ventura | UWC[b] | S02N21W | 0 | 0 | 2728 | **24053** | 7169 | 3645 | **20765** | **109625** | **47674** | 1444 | 0 | 51 | 217154 |
| Kern | CRS[a] | M27S25E | 0 | 0 | 5695 | 0 | **31211** | **23419** | **70393** | **25915** | 8149 | 0 | 1184 | **36417** | 202383 |
| Monterey | | M12S01E | 0 | 0 | 2165 | 4442 | 5809 | 14793 | **28382** | **43148** | **54187** | **30012** | 9682 | 0 | 192620 |
| Ventura | SHA[b] | S01N22W | 2152 | 23 | 13112 | **19910** | **20738** | **17899** | 1727 | **73580** | **21591** | 6863 | 2808 | 275 | 180678 |
| San Luis Obispo | PLN[b] | S10N33W | 0 | 2250 | 1575 | 0 | 0 | 858 | 0 | **21825** | **86883** | **37639** | 0 | 0 | 151030 |
| Monterey | | M13S03E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4029 | **58040** | **39720** | 21291 | 0 | 123080 |

[a] ARB monitoring sites, [b] AMBI monitoring sites

* Numbers in bold fond indicate the township-month use might result in an air concentration higher than 1 ppb